On knowledge representation and perceived design quality

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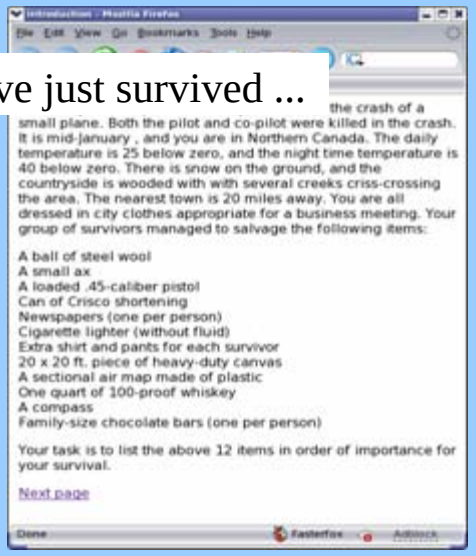
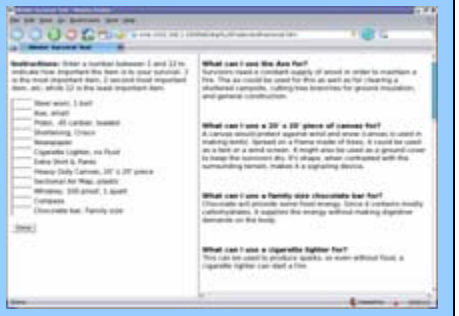


Background

Design cognition is the cognitive study of actual artifact design, focusing on the evolutionary nature of representations, the function of external representations, in a specific qualities of representation that influence the design process.

Relatively few design cognition studies focus on design results.
What studies exist, evaluate design quality by comparing a design artifact to an external standard, either judges or some real world yardstick (weight loads, winds, etc).
We are unaware of any design cognition studies that explore designer assessment of design quality.

Poor design decisions can result in huge upfront costs, in terms of lost time, lost money and possibly, lost lives.

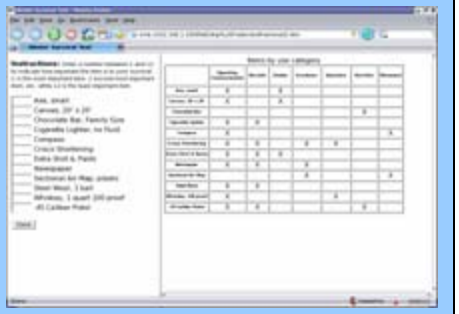


Purpose

Our aim is to study the impact of knowledge representation on a user's self assessment of design quality.

Hypothesis

Design tasks that are ambiguous in some way lead to an information search.
Structure can be added to discovered information that gives the appearance of addressing the ambiguous issues in the design task.
These structured representations may mask the actual utility of the data, yet provide comfort to the designer.
Our tentative experimental hypothesis is: we can construct a representation that a designer is comfortable using, yet reduces the quality of their work.



Method

Our design task is the winter survival task, which assigns the design goal of survival after an air crash, yet it does not provide the procedure for survival. The subjects must design a survival strategy, by ordering 12 items. We intervene by offering a reference document on winter survival in one of two different formats. When the subjects finish, they take a self-assessment survey, which we compare to their actual results; scored with a key provided by an expert in winter survival.

Anticipated Results

We believe the outcome of our research is that designers will make better predictions of performance. Organizations will be able to develop better products for less cost and less risk. Finally, we believe customers will benefit with more predictable product delivery and better quality at lower cost.
The potential impact of our work may lead to more accurate estimation methods for design projects.

References

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